Digital Output Modules for Compact FieldPoint and FieldPoint

NEW

NI [c]FP-DO-400, NI [c]FP-DO-401, NI [c]FP-DO-403, NI [c]FP-DO-410

- 8 or 16 digital outputs
  - 5 VDC
  - 12 VDC
  - 24 VDC
- Fused outputs for short circuit protection (DO-410)
- 2,300 V_{rms} bank isolation for transient overvoltage protection
- Hot swappable with autoconfiguration
- -40 to 70 °C operating range

Module	Output Channels	Output Ranges	Output Current Rating (see Specifications for More Details)	Compatibility Examples	Electronically Fused Outputs	All Channel Update Rate
[c]FP-DO-400	8	10 to 30 VDC, sourcing	2 A	12 and 24 VDC	–	20 kHz
[c]FP-DO-401	16	10 to 30 VDC, sourcing	2 A	12 and 24 VDC	–	20 kHz
[c]FP-DO-403	16	5 to 30 VDC, sinking	2 A	5, 12, and 24 VDC	–	20 kHz
[c]FP-DO-410	8	5 to 30 VDC, sourcing	1 A	5, 12, and 24 VDC	✓	20 kHz

Overview

The National Instruments [c]FP-DO-4xx devices are versatile digital output modules for Compact FieldPoint and FieldPoint that can be used to control digital signals ranging from 5 to 30 volts. These modules are commonly used to control indicator lights, external relays, and CMOS and TTL devices. All the modules include onboard diagnostics to ensure trouble-free installation and maintenance.

Digital Output Modules

The DO-4xx modules provide built-in module-to-module isolation to protect your FieldPoint system and controller or communication interface from high voltage levels. All the digital output modules use a common ground plane for the digital output channels.

The DO-400 and DO-401 modules are sourcing digital output modules capable of providing up to 2 A per channel, with a maximum power limit across the entire module as explained in the specifications section.

The DO-403 modules are sinking digital output modules capable of providing up to 2 A per channel, with a maximum power limit across the entire module as explained in the specifications section.

The DO-410 modules are sourcing digital output modules capable of providing up to 1 A per channel. They also feature an electronic fuse that will prevent damage to the module due to short circuits or other overcurrent situations. The fuses automatically reset when the output returns to a normal state. An LED indicates an overcurrent fault.

All the channels on the DO-4xx modules feature LEDs that indicate the output state of each channel. The modules all feature an all channel update rate of 20 kHz. Overall data throughput depends on software loop speeds and network speeds.

Isolation

The DO-4xx modules feature optical bank isolation with 2,300 V_{rms} of breakdown isolation. These Compact FieldPoint and FieldPoint modules do not have channel-to-channel isolation.

Digital Output Modules for Compact FieldPoint and FieldPoint

Field I/O Connections

The Compact FieldPoint and FieldPoint modules include a built-in power distribution bus that provides multiple power connections on the module. A field-wired power supply connected to the voltage (V) and common (C) terminals is internally connected to a power distribution bus that provides additional breakout terminals for voltage supply (V_{SUP}) and common (COM). These terminals provide a convenient way to distribute power to field devices that require external power.

The DO-400 and DO-410 each have:

- 8 digital output terminals (V_{OUT})
- 16 common terminals (COM)
- 8 power connections to power field devices (V_{SUP})

The DO-401 and DO-403 each have:

- 16 digital output terminals (V_{OUT})
- 8 common terminals (COM)
- 8 power connections to power field devices (V_{SUP})

Ordering Information

Compact FieldPoint

NI cFP-DO-400 777318-400
NI cFP-DO-401 777318-401
NI cFP-DO-403 777318-403
NI cFP-DO-410 777318-410

Recommended Compact FieldPoint System Products

NI cFP-2020 777317-2020
NI cFP-BP-4 778617-04
NI cFP-CB-1 778618-01
NI PS-4 Power Supply 778805-90
NI Developer Suite Professional Control Edition 777906-03

FieldPoint

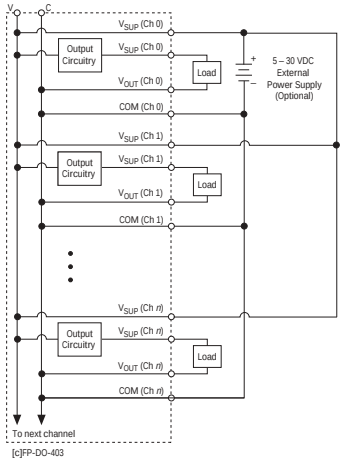
NI FP-DO-400 777518-400
NI FP-DO-401 777518-401
NI FP-DO-403 777518-403
NI FP-DO-410 777518-410

Recommended FieldPoint System Products

NI FP-1601 777792-01
NI FP-TB-1 777519-01
NI PS-4 Power Supply 778586-90
NI Developer Suite Standard Control Edition 777905-03

BUY ONLINE!

Visit ni.com/info and enter cfpdo400, cfpdo401, cfpdo403, cfpdo410, fpdo400, fpdo401, fpdo403, and/or fpdo410.



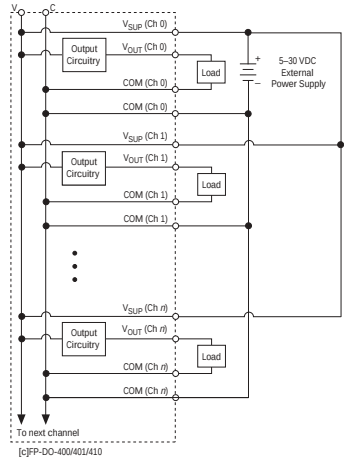


Figure 1. Wiring Schematics for DO Modules

Digital Output Modules for Compact FieldPoint and FieldPoint

Specifications

Typical for -40 to 70 °C unless otherwise noted.

Digital Output Channels

Number of output channels
- [c]FP-DO-400, [c]FP-DO-410 8
- [c]FP-DO-401, [c]FP-DO-403 16

Voltage range ..... 5-30 VDC

Output impedance at 10-30 V ..... 0.3 Ω (0.3 V drop at 1 A)
- [c]FP-DO-403 ..... 0.12 Ω

Output impedance at 5 to 10 V ..... 2 Ω

Maximum output current per channel at 10 to 30 V range
- [c]FP-DO-400, [c]FP-DO-403 ..... 2.0 A
- [c]FP-DO-401 ..... 1.5 A
- [c]FP-DO-410 ..... 1 A

Maximum output current on all channels
- [c]FP-DO-400 ..... 8 A^2
- [c]FP-DO-401 ..... 8 A^2
- FP-DO-403 ..... 16 A^2
- cFP-DO-403 ..... 16 A^2 at -40 to 60 °C; 12 A^2 at 60 to 70 °C
- [c]FP-DO-410 ..... 8 A

Maximum output current at 5 to 10 V range
- Per channel ..... 0.67 A
- All channels, [c]FP-DO-400* ..... 1.35 A^2
- All channels, [c]FP-DO-401* ..... 1.2 A^2

Output delay time
- Turn ON ..... 20 µs
- Turn OFF ..... 50 µs

Protection
- All modules ..... Flyback diode to COM for inductive loads
- FP-DO-410 ..... Electronic fuses for overcurrent protection

Leakage, overcurrent condition
- (FP-DO-410 only) ..... 1 mA

Power-on state ..... Off, until set to power-on state stored in local network module

*The sum of the squares of the output currents on every channel must be less than or equal to this value.

Power Requirements

Power from network module
- [c]FP-DO-400 ..... 300 mW
- [c]FP-DO-401 and FP-DO-403 ..... 600 mW
- [c]FP-DO-410 ..... 400 mW

Isolation Voltage

Channel-to-channel isolation ..... No isolation between channels

Transient overvoltage ..... 2,300 V_{rms}

Physical Characteristics

LED indicators
- POWER (green) ..... Power on and self-test passed
- READY (green) ..... Module configured and ready
- <0...15> or <0...7> (green) ..... On/off state of each channel
- <0...7> (red) (FP-DO-410 only) ..... Overcurrent condition

Dimensions (including terminal base) ..... 10.7 by 10.9 by 9.1 cm (4.2 by 4.3 by 3.6 in.)

Weight ..... 136 g (4.8 oz)

Environment

Operating temperature ..... -40 to 70 °C

Storage temperature ..... -55 to 85 °C

Relative humidity ..... 10% to 90%, noncondensing

Shock and Vibration

These specifications apply only to Compact FieldPoint. NI recommends Compact FieldPoint if your application is subject to shock and vibration.

Operating vibration, random
- (IEC 60068-2-64) ..... 10 to 500 Hz, 5 g_{rms}

Operating vibration, sinusoidal
- (IEC 60068-2-6) ..... 10 to 500 Hz, 5 g

Operating shock
- (IEC 60068-2-27) ..... 50 g, 3 ms half sine, 18 shocks at 6 orientations; 30 g, 11 ms half sine, 18 shocks at 6 orientations

Safety

This product is designed to meet the requirements of the following standards of safety for electrical equipment for measurement, control, and laboratory use:
- IEC 61010-1, EN 61010-1
- UL 3121-1, UL 61010C-1
- CAN/CSA C22.2 No. 1010.1

For UL, hazardous location, and other safety certifications, refer to the product label or to ***ni.com***

Electromagnetic Compatibility

CE, C-Tick, and FCC Part 15 (Class A) Compliant

Emissions ..... EN 55011 Class A at 10 m FCC Part 15A above 1 GHz

Immunity ..... EN 61326:1997 + A2:2001, Table 1

For EMC compliance, operate this device with shielded cabling.

CE Compliance

This product meets the essential requirements of applicable European Directives, as amended for CE Marking, as follows:

Low-Voltage Directive (safety) 73/23/EEC

Electromagnetic Compatibility
- Directive (EMC) 89/336/EEC

Refer to the Declaration of Conformity (DoC) for this product for any additional regulatory compliance information. To obtain the DoC for this product, visit ***ni.com/hardref.nsf/*** and search by model number or product line.